General and Plastic Surgery Devices Panel Meeting
Center for Devices and Radiological Health
U.S. Food and Drug Administration
July 24, 2003

Topic Summary

In the late 1980's and early 1990's the results of several randomized studies comparing total mastectomy with lumpectomy and adjuvant radiation therapy showed no deleterious effect on the rate of survival using the breast conservation therapy approach. The largest of these trials, the NSABP-06 trial, enrolled 1,257 patients and randomly assigned them to one of three treatment options: total mastectomy, lumpectomy alone, or lumpectomy plus radiation therapy. After an average follow-up of 20 years, it has been found that the incidence of local recurrence was approximately 10% in those treated by mastectomy, 3% treated by lumpectomy and radiation therapy, and 9% in those treated with lumpectomy alone.[1] What has been most noteworthy, however, is that despite the difference in incidence of local recurrence, there has been no difference in disease-free survival.[1] These findings support the concept that the presence or absence of disease in regional nodes is not the result of the methodical step-wise progression of disease but rather a biological indicator of a poor host-tumor relationship. Results such as these began the "minimalist era" in the surgical management of breast cancer in the early 1990's.

On November 19, 1996 the U.S. FDA Center for Devices and Radiological Health convened the General and Plastic Surgery Devices Panel to discuss the appropriate use of minimally invasive stereotactic breast biopsy devices. It was the panel's thought that such devices could be useful for breast cancer diagnostic purposes but clearance for therapeutic purposes could be problematic. At that time, the panel recommended that, as a first step initial study in examining the utility of these devices for therapeutic purposes, the results of a multi-institutional trial with patients stratified by type and size of their mammographic abnormality be conducted using a minimally invasive stereotactic approach and then by conducting an open re-excision. The examination of treatment margins by pathology could serve as a short-term efficacy endpoint by correlating the completeness of treatment using the minimally invasive approach versus the open re-resection of margins. In addition, they believed that local failure due to residual gross or heavy macroscopic disease could be detected by following patients out to approximately 18 months to 2 years.

Since the 1996 Panel recommendations, thermal ablation devices, including radiofrequency ablation[2,3,4], focused microwave[5], focused ultrasound,[6] interstitial laser photocoagulation[7,8], and cryoablation[9], have emerged and are in various stages of development for the treatment of breast cancers. These technologies use a minimally invasive approach to introduce energy into the tumor creating irreversible cell damage. Some of these devices have been cleared by the FDA and are marketed with the general

indication of soft tissue ablation. For a device to obtain a more specific indication, we expect a clinical study for this new indication demonstrating device safety and effectiveness. At this time, no minimally invasive ablation or surgery device has been cleared by the FDA specifically for the treatment of breast cancers.

The purpose of this session is three-fold. First, we would like to obtain an understanding regarding the level of evidence that would be required from studies of minimally invasive ablation followed by open re-excision before moving to studies of minimally invasive ablation with follow-up for cancer recurrence. Second we would like to obtain the Panel's recommendations regarding the specifics of such a pivotal study examining the safety and effectiveness of using these devices to ablate breast cancer in lieu of lumpectomy. Third we would like to have the panel discuss how the radiosensitivity and chemosensitivity of breast tissue may be altered when using thermal ablation devices to ablate breast cancer, and how these tissue effects may be adequately studied in clinical trials aimed at demonstrating the safety and effectiveness of thermal ablation devices for local breast cancer treatment.

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